

REMARKS

This application has been amended in a manner believed to place it in condition for allowance.

Status of the Claims

Claims 5, 6, 9, and 13 are amended to recite that the chromium oxide film is substantially 100% approximately 30 nm from the outermost surface. Support for the amendment may be found in Figure 2 and specification page 9, lines 5-10.

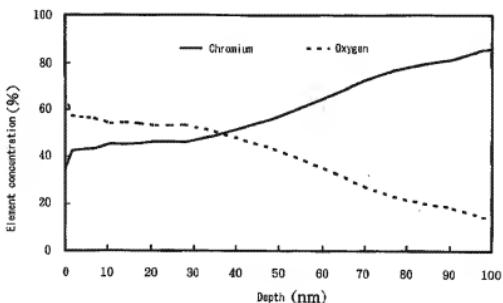
Claims 5, 6, 9, 13-16 and 18-21 remain pending in the application.

Claims Rejections-35 USC §103(a)

Claims 5, 6, 9, 14-16 and 18-21 were rejected under 35 USC §103(a) for being unpatentable over CARBO et al. U.S. 4,507,339 (CARBO) in view of UCHIDA et al. U.S. 4,248,676 (UCHIDA). Claim 13 was rejected under 35 USC §103(a) for being unpatentable over CARBO in view of UCHIDA, and further in view of OHMI U.S. 5,656,099 (OHMI). These rejections are respectfully traversed.

The independent claims 5, 6, 9, and 13 are directed to an article and structures that include a metallic material having a surface roughness (Ra) of not more than 1.5 μ m, and a chromium oxide passivation film formed on the metallic material surface, which is comprised of substantially 100% chromium oxide at least

30 nm from the outermost surface. This passivation film, as claimed, is formed by heating a chromium film coated directly onto the metallic material surface in an oxidizing atmosphere. The "substantially 100% chromium oxide at least 30 nm from the outermost surface" is illustrated by Figure 2 of the present application, shown below:



As shown in this figure, up to about 30 nm from the outermost surface of the coated chromium film after heated in an oxygen atmosphere contains 40% chromium and 60% oxygen after oxidation, i.e., up to about 30 nm from the outermost surface the oxidized film is Cr_2O_3 .

CARBO discloses a chromium/chromium oxide layer applied to a metal surface. CARBO specifies an overall concentration of chromium/chromium oxide applied to a metal surface, not a particular depth of 100% chromium oxide.

UCHIDA discloses filling holes formed in an electroplated chromium layer covering a metal surface with a

chromate (chromium hydrate and/or chromium oxide) layer. Beyond the chromate layer there is either (i) the steel substrate or (ii) a chromium layer. See, e.g., the figures of UCHIDA and column 4, lines 20-40.

The Official Action concluded that the combination of CARBO and UCHIDA teaches applying a chromium/chromium oxide coat on a metallic surface, and filling pin holes of the chromium/chromium oxide coating with the chromate layer of UCHIDA. The Official Action recognized that CARBO and/or UCHIDA fail to teach the claimed substantially 100% of chromium oxide.

OHMI was offered for teaching a chromium oxide passivation film consisting of chromium oxide provides improved corrosion resistant properties.

However, OHMI achieves the improved corrosion resistance by a method, i.e., direct formation, which UCHIDA considers unsuitable for the structures taught by CARBO and UCHIDA.

That is, UCHIDA recognizes that the direct formation of chromate film on a metal surface was known to improve corrosion resistance. However, UCHIDA discloses that films formed in this manner are not suitable for those metal surfaces that require subsequent surface treatment of an organic coating, e.g., as in the use of cans (See the paragraph bridging columns 2 and 3).

Thus, one of ordinary skill in the art would have been discouraged from modifying CARBO and/or UCHIDA in view of OHMI,

as OHMI describes a chromium oxide layer formed in a manner that would render the metal surfaces of CARBO and/or UCHIDA unsatisfactory for their intended use, i.e., organic coated can surfaces.

Moreover, even if one were to combine the publications as suggested, the combination fails to teach a passivation film formed by heating a chromium film coated directly onto the metallic material surface in an oxidizing atmosphere. OHMI does not disclose a chromium oxide passivation film coated on a surface of the metallic material. Rather, OHMI discloses the chromium oxide passivation film is a layer of the metallic material, i.e., the film is integral with the material. As evidenced by UCHIDA, the method of formation of the film does affect the properties of the film.

Therefore, the proposed combination fails to render obvious the independent claims 5, 6, 9, and 13, and the dependent claims, and withdrawal of the rejections is respectfully requested.

In view of the amendment to the claims and the foregoing remarks, applicants believe that the present application is in condition for allowance at the time of the next Official Action. Allowance and passage to issue on that basis is respectfully requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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